

SEQUENCE LISTING

*sub B1*

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Huang, Shau-Ku  
Maleki, Soheila J.  
Koppér, Randall A.

<120> Tertiary Structure of Peanut Allergen ARA H 1

<130> HS 110

<140> 09/267,719  
<141> 1999-03-11

<150> 60/077,763  
<151> 1998-03-13

<160> 13

<170> PatentIn Ver. 2.1

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<213> *Arachis hypogaea*

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Met Arg Gly Arg Val Ser Pro Leu Met Leu Leu Leu Gly Ile Leu Val  
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Leu Ala Ser Val Ser Ala Thr His Ala Lys Ser Ser Pro Tyr Gln Lys  
20 25 30

Lys Thr Glu Asn Pro Cys Ala Gln Arg Cys Leu Gln Ser Cys Gln Gln  
35 40 45

Glu Pro Asp Asp Leu Lys Gln Lys Ala Cys Glu Ser Arg Cys Thr Lys  
50 55 60

Leu Glu Tyr Asp Pro Arg Leu Val Tyr Asp Pro Arg Gly His Thr Gly  
65 70 75 80

Thr Thr Asn Gln Arg Ser Pro Pro Gly Glu Arg Thr Arg Gly Arg Gln  
85 90 95

Pro Gly Asp Tyr Asp Asp Asp Arg Arg Gln Pro Arg Arg Glu Glu Gly  
100 105 110

Gly Arg Trp Gly Pro Ala Gly Pro Arg Glu Arg Glu Arg Glu Asp  
115 120 125

Trp Arg Gln Pro Arg Glu Asp Trp Arg Arg Pro Ser His Gln Gln Pro  
130 135 140

Arg Lys Ile Arg Pro Glu Gly Arg Glu Gly Gln Glu Trp Gly Thr  
145 150 155 160

Pro Gly Ser His Val Arg Glu Glu Thr Ser Arg Asn Asn Pro Phe Tyr  
165 170 175

Phe Pro Ser Arg Arg Phe Ser Thr Arg Tyr Gly Asn Gln Asn Gly Arg  
180 185 190

Ile Arg Val Leu Gln Arg Phe Asp Gln Arg Ser Arg Gln Phe Gln Asn  
195 200 205

Leu Gln Asn His Arg Ile Val Gln Ile Glu Ala Lys Pro Asn Thr Leu  
210 215 220

Val Leu Pro Lys His Ala Asp Ala Asp Asn Ile Leu Val Ile Gln Gln  
225 230 235 240

Gly Gln Ala Thr Val Thr Val Ala Asn Gly Asn Asn Arg Lys Ser Phe  
245 250 255

Asn Leu Asp Glu Gly His Ala Leu Arg Ile Pro Ser Gly Phe Ile Ser  
260 265 270

Tyr Ile Leu Asn Arg His Asp Asn Gln Asn Leu Arg Val Ala Lys Ile  
275 280 285

Ser Met Pro Val Asn Thr Pro Gly Gln Phe Glu Asp Phe Phe Pro Ala  
290 295 300

Ser Ser Arg Asp Gln Ser Ser Tyr Leu Gln Gly Phe Ser Arg Asn Thr  
305 310 315 320

Leu Glu Ala Ala Phe Asn Ala Glu Phe Asn Glu Ile Arg Arg Val Leu  
325 330 335

Leu Glu Glu Asn Ala Gly Gly Glu Gln Glu Glu Arg Gly Gln Arg Arg  
340 345 350

Trp Ser Thr Arg Ser Ser Glu Asn Asn Glu Gly Val Ile Val Lys Val  
355 360 365

Ser Lys Glu His Val Glu Glu Leu Thr Lys His Ala Lys Ser Val Ser  
370 375 380

Lys Lys Gly Ser Glu Glu Glu Gly Asp Ile Thr Asn Pro Ile Asn Leu  
385 390 395 400

Arg Glu Gly Glu Pro Asp Leu Ser Asn Asn Phe Gly Lys Leu Phe Glu  
405 410 415

Val Lys Pro Asp Lys Lys Asn Pro Gln Leu Gln Asp Leu Asp Met Met  
420 425 430

Leu Thr Cys Val Glu Ile Lys Glu Gly Ala Leu Met Leu Pro His Phe  
435 440 445

Asn Ser Lys Ala Met Val Ile Val Val Val Asn Lys Gly Thr Gly Asn  
450 455 460

Leu Glu Leu Val Ala Val Arg Lys Glu Gln Gln Gln Arg Gly Arg Arg  
465 470 475 480

Glu Glu Glu Glu Asp Glu Asp Glu Glu Glu Glu Gly Ser Asn Arg Glu  
485 490 495

Val Arg Arg Tyr Thr Ala Arg Leu Lys Glu Gly Asp Val Phe Ile Met  
500 505 510

Pro Ala Ala His Pro Val Ala Ile Asn Ala Ser Ser Glu Leu His Leu  
515 520 525

Leu Gly Phe Gly Ile Asn Ala Glu Asn Asn His Arg Ile Phe Leu Ala  
530 535 540

Gly Asp Lys Asp Asn Val Ile Asp Gln Ile Glu Lys Gln Ala Lys Asp  
545 550 555 560

Leu Ala Phe Pro Gly Ser Gly Glu Gln Val Glu Lys Leu Ile Lys Asn  
565 570 575

Gln Lys Glu Ser His Phe Val Ser Ala Arg Pro Gln Ser Gln Ser Gln  
580 585 590

Ser Pro Ser Ser Pro Glu Lys Glu Ser Pro Glu Lys Glu Asp Gln Glu  
595 600 605

Glu Glu Asn Gln Gly Gly Lys Gly Pro Leu Leu Ser Ile Leu Lys Ala  
610 615 620

Phe Asn  
625

<210> 2  
<211> 371  
<212> PRT  
<213> Phaseolus vulgaris

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Asp Asn Pro Phe Tyr Phe Asn Ser Asp Asn Ser Trp Asn Thr Leu Phe  
1 5 10 15

Lys Asn Gln Tyr Gly His Ile Arg Val Leu Gln Arg Phe Asp Gln Gln  
20 25 30

*A1*  
Ser Lys Arg Leu Gln Asn Leu Glu Asp Tyr Arg Leu Val Glu Phe Arg  
35 40 45

Ser Lys Pro Glu Thr Leu Leu Pro Gln Gln Ala Asp Ala Glu Leu  
50 55 60

Leu Leu Val Val Arg Ser Gly Ser Ala Ile Leu Val Leu Val Lys Pro  
65 70 75 80

Asp Asp Arg Arg Glu Tyr Phe Phe Leu Thr Ser Asp Asn Pro Ile Phe  
85 90 95

*Sub B1*  
Ser Asp His Gln Lys Ile Pro Ala Gly Thr Ile Phe Tyr Leu Val Asn  
100 105 110

Pro Asp Pro Lys Glu Asp Leu Arg Ile Ile Gln Leu Ala Met Pro Val  
115 120 125

Asn Asn Pro Gln Ile His Glu Phe Phe Leu Ser Ser Thr Glu Ala Gln  
130 135 140

Gln Ser Tyr Leu Gln Glu Phe Ser Lys His Ile Leu Glu Ala Ser Phe  
145 150 155 160

Asn Ser Lys Phe Glu Glu Ile Asn Arg Val Leu Phe Glu Glu Gly  
165 170 175

Gln Gln Glu Gly Val Ile Val Asn Ile Asp Ser Glu Gln Ile Lys Glu  
180 185 190

Leu Ser Lys His Ala Lys Ser Ser Ser Arg Lys Ser Leu Ser Lys Gln  
195 200 205

Asp Asn Thr Ile Gly Asn Glu Phe Gly Asn Leu Thr Glu Arg Thr Asp  
210 215 220

Asn Ser Leu Asn Val Leu Ile Ser Ser Ile Glu Met Glu Glu Gly Ala  
225 230 235 240

Leu Phe Val Pro His Tyr Tyr Ser Lys Ala Ile Val Ile Leu Val Val  
245 250 255

Asn Glu Gly Glu Ala His Val Glu Leu Val Gly Pro Lys Gly Asn Lys  
260 265 270

*A1*  
Glu Thr Leu Glu Tyr Glu Ser Tyr Arg Ala Glu Leu Ser Lys Asp Asp  
275 280 285

Val Phe Val Ile Pro Ala Ala Tyr Pro Val Ala Ile Lys Ala Thr Ser  
290 295 300

Asn Val Asn Phe Thr Gly Phe Gly Ile Asn Ala Asn Asn Asn Arg  
305 310 315 320

Asn Leu Leu Ala Gly Lys Thr Asp Asn Val Ile Ser Ser Ile Gly Arg  
325 330 335

Ala Leu Asp Gly Lys Asp Val Leu Gly Leu Thr Phe Ser Gly Ser Gly  
340 345 350

Asp Glu Val Met Lys Leu Ile Asn Lys Gln Ser Gly Ser Tyr Phe Val  
355 360 365

Asp Ala His  
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<211> 510  
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<213> *Arachis hypogaea*

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1 5 10 15

Leu Asn Ala Gln Arg Pro Asp Asn Arg Ile Glu Ser Glu Gly Gly Tyr  
20 25 30

Ile Glu Thr Trp Asn Pro Asn Asn Gln Glu Phe Glu Cys Ala Gly Val  
35 40 45

Ala Leu Ser Arg Leu Val Leu Arg Arg Asn Ala Leu Arg Arg Pro Phe  
50 55 60

Tyr Ser Asn Ala Pro Gln Glu Ile Phe Ile Gln Gln Gly Arg Gly Tyr  
65 70 75 80

Phe Gly Leu Ile Phe Pro Gly Cys Pro Arg His Tyr Glu Glu Pro His  
85 90 95

Thr Gln Gly Arg Arg Ser Gln Ser Gln Arg Pro Pro Arg Arg Leu Gln  
100 105 110

Gly Glu Asp Gln Ser Gln Gln Gln Arg Asp Ser His Gln Lys Val His  
115 120 125

Arg Phe Asp Glu Gly Asp Leu Ile Ala Val Pro Thr Gly Val Ala Phe  
130 135 140

Trp Leu Tyr Asn Asp His Asp Thr Asp Val Val Ala Val Ser Leu Thr  
145 150 155 160

Asp Thr Asn Asn Asn Asp Asn Gln Leu Asp Gln Phe Pro Arg Arg Phe  
165 170 175

Asn Leu Ala Gly Asn Thr Glu Gln Glu Phe Leu Arg Tyr Gln Gln  
180 185 190

Ser Arg Gln Ser Arg Arg Arg Ser Leu Pro Tyr Ser Pro Tyr Ser Pro  
195 200 205

Gln Ser Gln Pro Arg Gln Glu Glu Arg Glu Phe Ser Pro Arg Gly Gln  
210 215 220

His Ser Arg Arg Glu Arg Ala Gly Gln Glu Glu Glu Asn Glu Gly Gly  
225 230 235 240

Asn Ile Phe Ser Gly Phe Thr Pro Glu Phe Leu Glu Gln Ala Phe Gln  
245 250 255

Val Asp Asp Arg Gln Ile Val Gln Asn Leu Arg Gly Glu Thr Glu Ser

260 265 270  
Glu Glu Glu Gly Ala Ile Val Thr Val Arg Gly Gly Leu Arg Ile Leu  
275 280 285  
Ser Pro Asp Arg Lys Arg Arg Ala Asp Glu Glu Glu Tyr Asp Glu  
290 295 300  
Asp Glu Tyr Glu Tyr Asp Glu Glu Asp Arg Arg Arg Gly Arg Gly Ser  
305 310 315 320  
Arg Gly Arg Gly Asn Gly Ile Glu Glu Thr Ile Cys Thr Ala Ser Ala  
325 330 335  
Lys Lys Asn Ile Gly Arg Asn Arg Ser Pro Asp Ile Tyr Asn Pro Gln  
340 345 350  
Ala Gly Ser Leu Lys Thr Ala Asn Asp Leu Asn Leu Leu Ile Leu Arg  
355 360 365  
Trp Leu Gly Leu Ser Ala Glu Tyr Gly Asn Leu Tyr Arg Asn Ala Leu  
370 375 380  
Phe Val Ala His Tyr Asn Thr Asn Ala His Ser Ile Ile Tyr Arg Leu  
385 390 395 400  
Arg Gly Arg Ala His Val Gln Val Val Asp Ser Asn Gly Asn Arg Val  
405 410 415  
Tyr Asp Glu Glu Leu Gln Glu Gly His Val Leu Val Val Pro Gln Asn  
420 425 430  
Phe Ala Val Ala Gly Lys Ser Gln Ser Glu Asn Phe Glu Tyr Val Ala  
435 440 445  
Phe Lys Thr Asp Ser Arg Pro Ser Ile Ala Asn Leu Ala Gly Glu Asn  
450 455 460  
Ser Val Ile Asp Asn Leu Pro Glu Glu Val Val Ala Asn Ser Tyr Gly  
465 470 475 480  
Leu Gln Arg Glu Gln Ala Arg Gln Leu Lys Asn Asn Asn Pro Phe Lys  
485 490 495  
Phe Phe Val Pro Pro Ser Gln Gln Ser Pro Arg Ala Val Ala  
500 505 510

<210> 4

<211> 473

<212> PRT

<213> Glycine max

<400> 4

Met Ala Ser Lys Val Val Ser Val Leu Val Ile Ala Met Met Leu Phe  
1 5 10 15

Ala Met Asn Cys Asn Cys Thr Ser Val Gly His Met Pro Ser Thr Lys  
20 25 30

Glu Glu Gly His Asp Phe Gln Glu Ser Lys Ala Lys Thr Thr Gln Thr  
35 40 45

Ala Asn Lys Ala Met Glu Thr Gly Lys Glu Gly Gln Glu Ala Ala Glu  
50 55 60

Ser Trp Thr Glu Trp Ala Lys Glu Lys Leu Ser Glu Gly Leu Gly Phe  
65 70 75 80

Lys His Asp Gln Glu Ser Lys Glu Ser Thr Thr Asn Lys Val Ser Asp  
85 90 95

Tyr Ala Thr Asp Thr Ala Gln Lys Ser Lys Asp Tyr Ala Thr Asp Thr  
100 105 110

Ala Gln Lys Ser Lys Asp Tyr Ala Gly Asp Ala Ala Gln Lys Ser Lys  
115 120 125

Asp Tyr Ala Gly Asp Ala Ala Gln Lys Thr Lys Asp Tyr Ala Ser Asp  
130 135 140

Thr Ala Gln Thr Ser Lys Asp Tyr Ala Gly Asp Ala Ala Gln Lys Ser  
145 150 155 160

Lys Gly Tyr Val Gly Asp Ala Ala Gln Lys Thr Lys Glu Tyr Val Gly  
165 170 175

Asp Ala Ala Gln Lys Thr Lys Asp Tyr Ala Thr Asp Ala Ala Gln Lys  
180 185 190

Thr Lys Asp Tyr Ala Thr Gln Lys Thr Lys Asp Tyr Ala Ser Asp Ala  
195 200 205

Thr Asp Ala Ala Lys Lys Thr Lys Asp Tyr Ala Ala Gln Lys Thr Lys  
210 215 220

Asp Tyr Ala Ser Glu Ala Ser Asp Val Ala Gln Asn Thr Lys Asp Tyr  
225 230 235 240

Ala Ala Gln Lys Thr Lys Asp Tyr Ala Ser Gly Gly Ala Gln Lys Thr  
245 250 255

Lys Asp Tyr Ala Ser Gly Gly Ala Gln Lys Thr Lys Asp Tyr Ala Ser  
260 265 270

Asp Ala Ala Gln Lys Thr Lys Asp Tyr Ala Ser Asp Gly Ala Gln Lys  
275 280 285

Ser Lys Glu Tyr Ala Gly Asp Val Ala Leu Asn Ala Lys Asp Tyr Ala  
290 295 300

Gln Lys Ser Lys Asp Tyr Ala Gly Asp Ala Ala Gln Asn Val Lys Asp  
305 310 315 320

Tyr Ala Ser Asp Ala Val Gln Lys Arg Lys Glu Tyr Ser Gly Asp Ala  
325 330 335

Ser His Lys Ser Lys Glu Ala Ser Asp Tyr Ala Ser Glu Thr Ala Lys  
340 345 350

Lys Thr Lys Asp Tyr Val Gly Asp Ala Ala Gln Arg Ser Lys Gly Ala  
355 360 365

Ala Glu Tyr Ala Ser Asp Ala Ala Gln Arg Thr Lys Glu Tyr Ala Gly  
370 375 380

Asp Ala Thr Lys Arg Ser Lys Glu Ala Ser Asn Asp His Ala Asn Asp  
385 390 395 400

Met Ala Gln Lys Thr Lys Asp Tyr Ala Ser Asp Thr Ala Gln Arg Thr  
405 410 415

Lys Glu Lys Leu Gln Asp Ile Ala Ser Glu Ala Gly Gln Tyr Ser Ala  
420 425 430

Glu Lys Ala Arg Glu Met Lys Asp Ala Ala Ala Glu Lys Ala Ser Asp  
435 440 445

Ile Ala Lys Ala Ala Lys Gln Lys Ser Gln Glu Val Lys Glu Lys Leu  
450 455 460

Gly Gly Gln His Arg Asp Ala Glu Leu  
465 470

~~A~~  
<210> 5  
<211> 18  
<212> RRT  
<213> Glycine max  
  
<220>  
<223> At position 1, Xaa can be either Ser, Lys, His, or  
Gly

<220>  
<223> At position 2, Xaa can be either Ile or Gly

<220>  
<223> At position 4, Xaa can be either Glu, Asp, or Leu

<220>  
<223> At position 7, Xaa can be any amino acid.

<220>  
<223> At position 8, Xaa can be either Thr, Leu, Glu,  
Asn, Ala, Ser, or Pro

<220>  
<223> At position 9, Xaa can be either Met, Leu, or Asn

<220>  
<223> At position 10, Xaa can be either Lys or Arg

<220>  
<223> At position 11, Xaa can be either Leu or Arg

<220>  
<223> At position 12, Xaa can be any amino acid.

<220>  
<223> At position 13, Xaa can be either Gln, Asn, Ala,  
Leu, Ser, Arg, Pro, Ile, or His

<220>  
<223> At position 16, Xaa can be any amino acid.

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Xaa Xaa Asp Xaa Thr Ile Xaa Xaa Xaa Xaa Xaa Xaa Asn Ile Xaa  
1 5 10 15

Gln Thr

*11*

<210> 6  
<211> 21  
<212> PRT  
<213> Glycine max

<220>  
<223> At position 2, Xaa can be either Val or Ile

<220>  
<223> At position 3, Xaa can be either Asp or Glu

<220>  
<223> At position 5, Xaa can be either Asn or Thr

<220>  
<223> At position 9, Xaa can be either Leu or Met

<220>  
<223> At position 11, Xaa can be either Arg or Leu

<220>  
<223> At position 12, Xaa can be either Arg, Asn, or Ala

<220>  
<223> At position 13, Xaa can be either Ala or Gln

<220>  
<223> At position 16, Xaa can be either Ala or Gly

<220>  
<223> At position 18, Xaa can be either Asn or Thr

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<220>  
<223> At position 20, Xaa can be any amino acid

<220>  
<223> At position 21, Xaa can be either Pro, Gly, Ala, or Val

<400> 6  
Gly Xaa Xaa Glu Xaa Ile Ala Thr Xaa Arg Xaa Xaa Xaa Asn Ile Xaa  
1 5 10 15

Gln Xaa Xaa Xaa Xaa

*A1*

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<211> 25
<212> PRT
<213> Glycine max

<220>
<223> At position 2, Xaa can be either Ile, Val, Leu, or
      Phe

<220>
<223> At position 3, Xaa can be either Asp or Glu

<220>
<223> At position 4, Xaa can be either Glu or Leu

<220>
<223> At position 5, Xaa can be either Asn or Thr

<220>
<223> At position 8, Xaa can be either Gln or Thr

<220>
<223> At position 9, Xaa can be either Met, Leu, Asn, or
      Pro

<220>
<223> At position 10, Xaa can be either Arg or Pro

<220>
<223> At position 11, Xaa can be either Leu, Arg, or Ala

<220>
<223> At position 12, Xaa can be either Arg or Ala

<220>
<223> At position 13, Xaa can be either Gln, Asp, Asn,
      or Arg

<220>
<223> At position 15, Xaa can be either Ser or Ile

<220>
<223> At position 18, Xaa can be either Asn, Gln, Pro,
      Leu, Thr, Ala, or Asp

<220>
<223> At position 20, Xaa can be either Ser, Ala, or Gly
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<220>  
<223> At position 21, Xaa can be either any amino acid

<220>  
<223> At position 22, Xaa can be Asp, Asn, or Pro

<220>  
<223> At position 23, Xaa can be either Ile, Asp, Asn,  
Ala, Val, or Phe

<220>  
<223> At position 25, Xaa can be either Asn, Ala, or Leu

<220>  
<223> At position 16, Xaa can be either Ala or Gly

<400> 7  
Gly Xaa Xaa Xaa Xaa Ile Ala Xaa Xaa Xaa Xaa Xaa Asn Xaa Xaa  
1 5 10 15

A,  
Gln Xaa Ser Xaa Xaa Xaa Xaa Tyr Xaa  
20 25

<210> 8  
<211> 484  
<212> PRT  
<213> Glycine max

<400> 8  
Met Ala Lys Leu Val Leu Ser Leu Cys Phe Leu Leu Phe Ser Gly Cys  
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Phe Ala Leu Arg Glu Gln Ala Gln Gln Asn Glu Cys Gln Ile Gln Lys  
20 25 30

Leu Asn Ala Leu Lys Pro Asp Asn Arg Ile Glu Ser Glu Gly Gly Phe  
35 40 45

Ile Glu Thr Trp Asn Pro Asn Asn Lys Pro Phe Gln Cys Ala Gly Val  
50 55 60

Ala Leu Ser Arg Cys Thr Leu Asn Arg Asn Ala Leu Arg Arg Pro Ser  
65 70 75 80

Tyr Thr Asn Gly Pro Gln Glu Ile Tyr Ile Gln Gln Gly Asn Gly Ile  
85 90 95

Phe Gly Met Ile Phe Pro Gly Cys Pro Ser Thr Tyr Gln Glu Pro Gln  
100 105 110

Glu Ser Gln Gln Arg Gly Arg Ser Gln Arg Pro Gln Asp Arg His Gln  
115 120 125

Lys Val His Arg Phe Arg Glu Gly Asp Leu Ile Ala Val Pro Thr Gly  
130 135 140

Val Ala Trp Trp Met Tyr Asn Asn Glu Asp Thr Pro Val Val Ala Val  
145 150 155 160

Ser Ile Ile Asp Thr Asn Ser Leu Glu Asn Gln Leu Asp Gln Met Pro  
165 170 175

Arg Arg Phe Tyr Leu Ala Gly Asn Gln Glu Gln Glu Phe Leu Lys Tyr  
180 185 190

A/ Gln Gln Gln Gln Gly Gly Ser Gln Ser Gln Lys Gly Lys Gln Gln  
195 200 205

Glu Glu Glu Asn Glu Gly Ser Asn Ile Leu Ser Gly Phe Ala Pro Glu  
210 215 220

Phe Leu Lys Glu Ala Phe Gly Val Asn Met Gln Ile Val Arg Asn Leu  
225 230 235 240

Gln Gly Glu Asn Glu Glu Asp Ser Gly Ala Ile Val Thr Val Lys  
245 250 255

Gly Gly Leu Arg Val Thr Ala Pro Ala Met Arg Lys Pro Gln Gln Glu  
260 265 270

Glu Asp Asp Asp Asp Glu Glu Gln Pro Gln Cys Val Glu Thr Asp  
275 280 285

Lys Gly Cys Gln Arg Gln Ser Lys Arg Ser Arg Asn Gly Ile Asp Glu  
290 295 300

Thr Ile Cys Thr Met Arg Leu Arg Gln Asn Ile Gly Gln Asn Ser Ser  
305 310 315 320

Pro Asp Ile Tyr Asn Pro Gln Ala Gly Ser Ile Thr Thr Ala Thr Ser  
325 330 335

Leu Asp Phe Pro Ala Leu Trp Leu Leu Lys Leu Ser Ala Gln Tyr Gly  
340 345 350

Ser Leu Arg Lys Asn Ala Met Phe Val Pro His Tyr Thr Leu Asn Ala  
355 360 365

Asn Ser Ile Ile Tyr Ala Leu Asn Gly Arg Ala Leu Val Gln Val Val  
370 375 380

Asn Cys Asn Gly Glu Arg Val Phe Asp Gly Glu Leu Gln Glu Gly Gly  
385 390 395 400

Val Leu Ile Val Pro Gln Asn Phe Ala Val Ala Ala Lys Ser Gln Ser  
405 410 415

Asp Asn Phe Glu Tyr Val Ser Phe Lys Thr Asn Asp Arg Pro Ser Ile  
420 425 430

Gly Asn Leu Ala Gly Ala Asn Ser Leu Leu Asn Ala Leu Pro Glu Glu  
435 440 445

Val Ile Gln His Thr Phe Asn Leu Lys Ser Gln Gln Ala Arg Gln Val  
450 455 460

Lys Asn Asn Asn Pro Phe Ser Phe Leu Val Pro Pro Gln Glu Ser Gln  
465 470 475 480

Arg Ala Val Ala

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<210> 9  
<211> 485  
<212> PRT  
<213> Glycine max

<400> 9  
Met Ala Lys Leu Val Leu Ser Leu Cys Phe Leu Leu Phe Ser Gly Cys  
1 5 10 15

Phe Ala Leu Arg Glu Gln Ala Gln Gln Asn Glu Cys Gln Ile Gln Lys  
20 25 30

Leu Asn Ala Leu Lys Pro Asp Asn Arg Ile Glu Ser Glu Gly Gly Phe  
35 40 45

Ile Glu Thr Trp Asn Pro Asn Asn Lys Pro Phe Gln Cys Ala Gly Val  
50 55 60

Ala Leu Ser Arg Cys Thr Leu Asn Arg Asn Ala Leu Arg Arg Pro Ser

65

70

75

80

Tyr Thr Asn Gly Pro Gln Glu Ile Tyr Ile Gln Gln Gly Asn Gly Ile  
85 90 95

Phe Gly Met Ile Phe Pro Gly Cys Pro Ser Thr Tyr Gln Glu Pro Gln  
100 105 110

Glu Ser Gln Gln Arg Gly Arg Ser Gln Arg Pro Gln Asp Arg His Gln  
115 120 125

Lys Val His Arg Phe Arg Glu Gly Asp Leu Ile Ala Val Pro Thr Gly  
130 135 140

Val Ala Trp Trp Met Tyr Asn Asn Glu Asp Thr Pro Val Val Ala Val  
145 150 155 160

Ser Ile Ile Asp Thr Asn Ser Leu Glu Asn Gln Leu Asp Gln Met Pro  
165 170 175

Arg Arg Phe Tyr Leu Ala Gly Asn Gln Glu Gln Glu Phe Leu Lys Tyr  
180 185 190

Gln Gln Gln Gln Gly Gly Ser Gln Ser Gln Lys Gly Lys Gln Gln  
195 200 205

Glu Glu Glu Asn Glu Gly Ser Asn Ile Leu Ser Gly Phe Ala Pro Glu  
210 215 220

Phe Leu Lys Glu Ala Phe Gly Val Asn Met Gln Ile Val Arg Asn Leu  
225 230 235 240

Gln Gly Glu Asn Glu Glu Asp Ser Gly Ala Ile Val Thr Val Lys  
245 250 255

Gly Gly Leu Arg Val Thr Ala Pro Ala Met Arg Lys Pro Gln Gln Glu  
260 265 270

Glu Asp Asp Asp Asp Glu Glu Glu Gln Pro Gln Cys Val Glu Thr Asp  
275 280 285

Lys Gly Cys Gln Arg Gln Ser Lys Arg Ser Arg Asn Gly Ile Asp Glu  
290 295 300

Thr Ile Cys Thr Met Arg Leu Arg Gln Asn Ile Gly Gln Asn Ser Ser  
305 310 315 320

Pro Asp Ile Tyr Asn Pro Gln Ala Gly Ser Ile Thr Thr Ala Thr Ser

325

330

335

Leu Asp Phe Pro Ala Leu Trp Leu Leu Lys Leu Ser Ala Gln Tyr Gly  
340 345 350

Ser Leu Arg Lys Asn Ala Met Phe Val Pro His Tyr Thr Leu Asn Ala  
355 360 365

Asn Ser Ile Ile Tyr Ala Leu Asn Gly Arg Ala Leu Val Gln Val Val  
370 375 380

Asn Cys Asn Gly Glu Arg Val Phe Asp Gly Glu Leu Gln Glu Gly Gly  
385 390 395 400

Val Leu Ile Val Pro Gln Asn Phe Ala Val Ala Ala Lys Ser Gln Ser  
405 410 415

Asp Asn Phe Glu Tyr Val Ser Phe Lys Thr Asn Asp Arg Pro Ser Ile  
420 425 430

*A1*  
Gly Asn Leu Ala Gly Ala Asn Ser Leu Leu Asn Ala Leu Pro Glu Glu  
435 440 445

Val Ile Gln His Thr Phe Asn Leu Lys Ser Gln Gln Ala Arg Gln Val  
450 455 460

Lys Asn Asn Asn Pro Phe Ser Phe Leu Val Pro Pro Gln Glu Ser Gln  
465 470 475 480

Arg Arg Ala Val Ala  
485

<210> 10  
<211> 185  
<212> PRT  
<213> *Arachis hypogaea*

<400> 10  
Gly Ile Glu Glu Thr Ile Cys Thr Ala Ser Ala Lys Lys Asn Ile Gly  
1 5 10 15

Arg Asn Arg Ser Pro Asp Ile Tyr Asn Pro Gln Ala Gly Ser Leu Lys  
20 25 30

Thr Ala Asn Asp Leu Asn Leu Leu Ile Leu Arg Trp Leu Gly Leu Ser  
35 40 45

Ala Glu Tyr Gly Asn Leu Tyr Arg Asn Ala Leu Phe Val Ala His Tyr  
50 55 60

Asn Thr Asn Ala His Ser Ile Ile Tyr Arg Leu Arg Gly Arg Ala His  
65 70 75 80

Val Gln Val Val Asp Ser Asn Gly Asn Arg Val Tyr Asp Glu Glu Leu  
85 90 95

Gln Glu Phe Xaa Val Leu Val Val Pro Gln Asn Phe Ala Val Ala Gly  
100 105 110

Lys Ser Gln Ser Glu Asn Phe Glu Tyr Val Ala Phe Lys Thr Asp Ser  
115 120 125

Arg Pro Ser Ile Ala Asn Leu Ala Gly Glu Asn Ser Val Ile Asp Asn  
130 135 140

Leu Pro Glu Glu Val Val Ala Asn Ser Tyr Gly Leu Gln Arg Glu Gln  
145 150 155 160

Ala Arg Gln Leu Lys Asn Asn Asn Pro Phe Lys Phe Phe Val Pro Pro  
165 170 175

Ser Gln Gln Ser Pro Arg Ala Val Ala  
180 185

<210> 11

<211> 46

<212> PRT

<213> Glycine max

<400> 11

Asn Gln Leu Asp Gln Met Pro Arg Arg Phe Tyr Leu Ala Gly Asn Gln  
1 5 10 15

Glu Gln Glu Phe Leu Lys Tyr Gln Gln Gln Gln Gly Ser Gln  
20 25 30

Ser Gln Lys Gly Lys Gln Gln Glu Glu Asn Glu Gly Ser  
35 40 45

<210> 12

<211> 156

<212> PRT

<213> Arachis hypogaea

<400> 12

Leu Thr Ile Leu Val Ala Leu Ala Leu Phe Leu Leu Ala Ala His Ala  
1 5 10 15

Ser Ala Arg Gln Gln Trp Glu Leu Gln Gly Asp Arg Arg Cys Gln Ser  
20 25 30

Gln Leu Glu Arg Ala Asn Leu Arg Pro Cys Glu Gln His Leu Met Gln  
35 40 45

Lys Ile Gln Arg Asp Glu Asp Ser Tyr Glu Arg Asp Pro Tyr Ser Pro  
50 55 60

Ser Gln Asp Pro Tyr Ser Pro Ser Pro Tyr Asp Arg Arg Gly Ala Gly  
65 70 75 80

Ser Ser Gln His Gln Glu Arg Cys Cys Asn Glu Leu Asn Glu Phe Glu  
85 90 95

Asn Asn Gln Arg Cys Met Cys Glu Ala Leu Gln Gln Ile Met Glu Asn  
100 105 110

41  
Gln Ser Asp Arg Leu Gln Gly Arg Gln Gln Glu Gln Gln Phe Lys Arg  
115 120 125

Glu Leu Arg Asn Leu Pro Gln Gln Cys Gly Leu Arg Ala Pro Gln Arg  
130 135 140

Cys Asp Leu Asp Val Glu Ser Gly Gly Arg Asp Tyr  
145 150 155

<210> 13

<211> 166

<212> PRT

<213> Arachis hypogaea

<400> 13

Met Ala Ser Met Thr Gly Gly Gln Met Gly Arg Asp Pro Asn Ser Ala  
1 5 10 15

Arg Gln Gln Trp Glu Leu Gln Gly Asp Arg Arg Cys Gln Ser Gln Leu  
20 25 30

Glu Arg Ala Asn Leu Arg Pro Cys Glu Gln His Leu Met Gln Lys Ile  
35 40 45

Gln Arg Asp Glu Asp Ser Tyr Glu Arg Asp Pro Tyr Ser Pro Ser Gln  
50 55 60

Asp Pro Tyr Ser Pro Ser Pro Tyr Asp Arg Arg Gly Ala Gly Ser Ser  
65 70 75 80

Gln His Gln Glu Arg Cys Cys Asn Glu Leu Asn Glu Phe Glu Asn Asn  
85 90 95

Gln Arg Cys Met Cys Glu Ala Leu Gln Gln Ile Met Glu Asn Gln Ser  
100 105 110

Asp Arg Leu Gln Gly Arg Gln Gln Glu Gln Gln Phe Lys Arg Glu Leu  
115 120 125

Arg Asn Leu Pro Gln Gln Cys Gly Leu Arg Ala Pro Gln Arg Cys Asp  
130 135 140

Leu Asp Val Glu Ser Gly Gly Arg Asp Arg Tyr Ala Ala Ala Leu Glu  
145 150 155 160

His His His His His  
165